AMENDMENTS TO THE DRAWINGS

Submitted with this Amendment are five sheets of replacement drawing figures including Figs. 1-10. These replacement sheets of drawing figures should replace all of the original drawing figures including Figs. 1-10.

Replacement Sheets

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the following remarks.

Before addressing the issues raised in the Official Action, it is noted that box "12a" on form PTOL-326 has been checked, but none of the subsequent boxes (i.e., box "1", box "2" or box "3" under item "12a)) have been checked. It is understood that the certified copy of the priority document has been received. If the undersigned's understanding is incorrect, the Examiner is kindly asked to notify the undersigned.

Submitted with this Amendment are replacement versions of the original drawing figures. The replacement drawings present the drawings in a more formal manner without any changes.

Claim 2 has been reworded to better define the claimed subject matter and thus address the issue raised at the top of page three of the Official Action. Accordingly, withdrawal of the claim rejection based on the second paragraph of 35 U.S.C. § 112 is respectfully requested.

The subject matter of this application pertains to a rotary solenoid apparatus comprising a rotation shaft, regulating means for regulating the rotation range of the rotating shaft, a permanent magnet fixed to the rotating shaft, a spring urging the rotational shaft in the circumferential direction, a yoke comprising a pair of stator portions opposite to the permanent magnet with a predetermined clearance, a coil wound on the yoke, and an energization control means for controlling the energization of the coil so that the coil is selectively excited, with the permanent magnet being magnetized in the radial direction of the rotation shaft.

The recitation defining that the permanent magnet is magnetized in the radial direction of the rotation shaft generally refers to magnetization in a direction toward the outside from the center portion, or from the center portion towards the outside. That is, the north (south) pole of the permanent magnet is formed on the outside of the permanent magnet while the south (north) pole is formed on the inside of the permanent magnet.

The Official Action sets forth a rejection of original Claims 1 and 2 based on a combination of the disclosures in two different documents. In this regard, the Official Action refers to U.S. Patent No. 4,660,010 to *Odogaki et al.* and U.S. Patent No. 4,647,009 to *Idogaki et al.* It is noted that U.S. Patent No. 4,660,010 identifies *Burton* as the inventive entity while the *Odogaki et al.* patent is identified as U.S. Patent No. 4,428,558. Considering the discussion in the Official Action, it is understood that the primary reference relied upon in the Official Action is U.S. Patent No. 4,428,558 to *Odogaki et al.*

Odogaki et al. discloses a proportional solenoid in which a permanent magnet 10 is connected to a shaft 3 and a coil 17. When current is supplied to the coil 17, the shaft 3 rotates. As stated in column 2, lines 32-34 of *Odogaki et al.*, the permanent magnet 10 is disk-shaped and is magnetized in the thicknesswise direction. The permanent magnet 10 is thus magnetized from one side to the other side as shown in Fig. 2c (in the horizontal direction of Fig. 2c). That is, the permanent magnet 10 is not magnetized in the radial direction as recited in Claim 1.

To more clearly set forth this difference between the rotary solenoid apparatus at issue here and the disclosure in *Odogaki et al.*, Claim 1 has been amended to recite that the variation of the magnetic flux by the permanent magnet becomes

constant with respect to the rotation of the permanent magnet when the permanent magnet is rotated as discussed near the middle of page 5 of the present application. Because the permanent magnet is magnetized in the radial direction, the rotational torque generated in the rotational shaft becomes approximately constant within the rotation range of the rotation shaft when a generally constant current is supplied. On the hand, the rotation torque increases generally constantly when the amount of current increases generally constantly. Thus, the relationship between the current and the rotational torque in the rotation range is approximately proportional as illustrated in Fig. 10 of the present application. As a result, the amount of increase in the generated torque is approximately equal to the urging force (rotational torque) of the torsion spring so that the rotational shaft rotates while balancing out the urging force of the torsion spring. Thus, the rotational speed of the rotation shaft decreases.

Idogaki et al. disclose an electromagnetic rotary driving device provided with a permanent magnet 4, a coil excitation circuit EN and a pulse generator PLS. The permanent magnet 4 is magnetized from one side to the other side as generally shown in Fig. 2 in much the same way as *Odogaki et al.* That is, the permanent 4 is magnetized in the X direction depicted in Fig. 3. Thus, like *Odogaki et al.*, *Idogaki et al.* does not disclose a permanent magnet that is magnetized in the radial direction, with the variation of the magnetic flux by the permanent magnet becoming constant with respect to the rotation of the permanent magnet when the permanent magnet is rotated.

Considering the deficiencies pointed out above, it is respectfully submitted that a combination the disclosures in *Odogaki et al.* and *Idogaki et al.* would not have

resulted in a rotary solenoid apparatus having the claimed arrangement and combination of features set forth in independent Claim 1. Accordingly, withdrawal of the rejection of record and allowance of this application are earnestly solicited.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

BUCHANAN INGERSOLL PC

Date: September 30, 2005

By: _____
Matthew L. Schneider
Registration No. 32,814

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620